Intel® Workstation Board S5000XVN User Guide

A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies/ Products

Intel Order Number D36222-002

Disclaimer

Information in this document is provided in connection with Intel® products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not designed, intended or authorized for use in any medical, life saving, or life sustaining applications or for any other application in which the failure of the Intel product could create a situation where personal injury or death may occur. Intel may make changes to specifications and product descriptions at any time, without notice.

Intel workstation boards contain a number of high-density VLSI and power delivery components that need adequate airflow for cooling. Intel's own chassis are designed and tested to meet the intended thermal requirements of these components when the fully integrated system is used together. It is the responsibility of the system integrator that chooses not to use Intel developed server building blocks to consult vendor datasheets and operating parameters to determine the amount of airflow required for their specific application and environmental conditions. Intel Corporation can not be held responsible if components fail or the workstation board does not operate correctly when used outside any of their published operating or non-operating limits.

Intel, Intel Pentium, and Intel Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

* Other names and brands may be claimed as the property of others.

Copyright © 2006, Intel Corporation. All Rights Reserved

Safety Information

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See also Intel Server Boards and Server Chassis Safety Information on the *Intel® Server Deployment Toolkit 2.0 CD* and/or at http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warnund Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und Servergehäusen auf der *Intel® Server Deployment Toolkit 2.0 CD* oder unter http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez Intel Server Boards and Server Chassis Safety Information sur le *Intel® Server Deployment Toolkit 2.0 CD* ou bien rendez-vous sur le site http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea Intel Server Boards and Server Chassis Safety Information en el *Intel® Server Deployment Toolkit 2.0 CD* y/o en http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。 和/或 http://support.intel.com/support/motherboards/server/sb/CS-010770.htm *上的 Intel Server Boards and Server Chassis Safety Information（《Intel 服务器主板与服务器机箱安全信息》）。*

Warnings

Heed safety instructions: Before working with your workstation product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in noncompliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the workstation and disconnect the power cord, telecommunications systems, networks, and modems attached to the workstation before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground any unpainted metal surface on your workstation when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the workstation, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the pins on the board.

Preface

About this Manual

Thank you for purchasing and using the Intel® Workstation Board S5000XVN.

Multiple versions of the Intel® Workstation Board S5000XVN are available. This manual applies to workstation boards with the following product codes:

- S5000XVNSAS
- S5000XVNSATA

Where a feature varies from one product to the next, the difference will be noted in this document. Unless specified, features apply to all versions of the workstation board.

This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing this workstation board. This document provides a brief overview of the features of the board/chassis, a list of accessories or other components you may need, troubleshooting information, and instructions on how to add and replace components on the Intel® Workstation Board S5000XVN. For the latest version of this manual, see http://support.intel.com/support/motherboards/server/S5000XVN/.

Manual Organization

Chapter 1 provides a brief overview of the Server Board S5000XVN. In this chapter, you will find a list of the workstation board features, photos of the product, and product diagrams to help you identify components and their locations.

Chapter 2 provides instructions on using the utilities that are shipped with the board or that may be required to update the system. This includes how to navigate through the BIOS Setup screens, how to perform a BIOS update, and how to reset the password or CMOS. Information about the specific BIOS settings and screens is available in the Technical Product Specification. See “Additional Information and Software” on page viii for a link to the Technical Product Specification.

Chapter 3 provides instructions on adding and replacing components. Use this chapter for step-by-step instructions and diagrams for installing or replacing components such as the memory, processor, and the CMOS battery.

Chapter 4 provides troubleshooting information. In this chapter, you will find BIOS error messages and POST code messages. You will also find suggestions for performing troubleshooting activities to identify the source of a problem.

Product Accessories

This workstation board is compatible with the following Intel® Server Chassis:

- Intel® Server Chassis SC5400 Base
- Intel® Entry Server Chassis SC5299-E WS

You may need or want to purchase one or more of the following items for your workstation:

Processor, memory FBDIMMs, hard drive, USB floppy drive, CD-ROM or DVD-ROM drive, RAID controller, operating system.

For information about which accessories, memory, processors, and third-party hardware have been tested and can be used with your board, and for ordering information for Intel products, see http://support.intel.com/support/motherboards/server/S5000XVN/compat.htm.

Additional Information and Software

If you need more information about this product or information about the accessories that can be used with this workstation board, use the following resources. These files are available at http://support.intel.com/support/motherboards/server/S5000XVN/

Table 1. Additional Information and Software

For this Information or Software	Use this Document or Software
Technical information, including BIOS settings and chipset information	*Intel® Workstation Board S5000XVN Technical Product Specification* and the *Intel® S5000 Series Chipsets Server Board Family Datasheet.* See the section on the web page titled *Technical Specifications*.
Hardware integration instructions	*Intel® Workstation Board S5000XVN Quick Start User's Guide* in the product box. See the section on the web page titled *Installation and Use*.
Virtual system tours and interactive repair information	A link to the SMaRT Tool is available under *Other Resources* at the right side of the screen at http://support.intel.com/support/motherboards/server/S5000XVN
Accessories or other Intel server products	Spares and Configuration Guide. See the section on the web page titled *Installation and Use*.
Hardware and operating systems that have been tested with this product	Tested Hardware Operating Systems List. See the section on the web page titled *Compatibility*.

Table 1. Additional Information and Software

For this Information or Software	Use this Document or Software
Chassis that have been tested with this product	Reference Chassis List. See the section on the web page titled *Compatibility*.
Processors that have been tested with this product	Supported Processors. See the section on the web page titled *Compatibility*.
FBDIMMs that have been tested with this product	Tested Memory List. See the section on the web page titled *Compatibility*.
To make sure your system falls within the allowed power budget	Power Budget Analysis Tool. See the section on the web page titled *Installation & Use*
Software to manage your Intel® workstation	Intel System Management Software. See the section on the web page titled *Installation & Use*
Drivers	Driver (for an extensive list of available drivers), Operating System Driver (for operating system drivers). See the section on the web page titled *Software & Drivers*.
Firmware and BIOS updates, or BIOS recovery files	Firmware Updates. See the section on the web page titled *Software & Drivers*.
Diagnostics test software	Diagnostics. See the section on the web page titled *Software & Drivers*.

See also the *Intel® Server Deployment Toolkit 2.0 CD* that came with your workstation board.

Contents

Safety Information iii
Important Safety Instructions iii
Wichtige Sicherheitshinweise iii
Consignes de sécurité iii
Instrucciones de seguridad importantes iii
Warnings v

Preface vii
About this Manual vii
Manual Organization vii
Product Accessories viii
Additional Information and Software viii

Chapter 1: Workstation Board Features 1
Connector and Header Locations 4
Configuration Jumpers 6
Intel® Light-Guided Diagnostics 8
Back Panel Features 11
RAID Support 12
SATA Workstation Board 12
SAS Workstation Board 13
Audio Support 14
Hardware Requirements 15
Processor 15
Memory 15
Power Supply 17
Optional Hardware 18
Intel® RAID Activation Key 18
Hard Disk Drives 18
Intel® Local Control Panel 18

Chapter 2: System Utilities 19
Using the BIOS Setup Utility 19
Starting Setup 19
If You Cannot Access Setup 19
Setup Menus 20
Upgrading the BIOS 21
Preparing for the Upgrade 22
Upgrading the BIOS 22
Reverting to the Previous BIOS 23

Clearing the Password 24
Clearing the CMOS 25

Chapter 3: Hardware Installations and Upgrades 27
Before You Begin 27
Tools and Supplies Needed 27
Installing and Removing Memory 27
Installing FBDIMMs 27
Removing FBDIMMs 30
Installing or Replacing the Processor 30
Installing the Processor 31
Installing the Heatsink(s) 34
Removing a Processor 37
Replacing the CMOS Battery 40

Appendix A: Getting Help 43
World Wide Web 43
Telephone 43

Appendix B: Regulatory and Compliance Information 47
Product Regulatory Compliance 47
Product Safety Compliance 47
Certifications / Registrations / Declarations 48
Product Regulatory Compliance Markings 48
Electromagnetic Compatibility Notices 49
FCC (USA) 49
ICES-003 (Canada) 50
Europe (CE Declaration of Conformity) 50
VCCI (Japan) 50
BSMI (Taiwan) 51
RRL (Korea) 51
CNCA (CCC-China) 51
Restriction of Hazardous Substances (RoHS) Compliance 52
End-of-Life / Product Recycling 52

Appendix C: Troubleshooting 53
System Boot Quiet Time 53
Resetting the System 53
Problems following Initial System Installation 54
First Steps Checklist 54
Hardware Diagnostic Testing 55
Verifying Proper Operation of Key System Lights 55
Confirming Loading of the Operating System 55
Specific Problems and Corrective Actions 56
Power Light Does Not Light 56
No Characters Appear on Screen 57

Characters Are Distorted or Incorrect 58
System Cooling Fans Do Not Rotate Properly 58
CD-ROM Drive or DVD-ROM Drive Activity Light Does Not Light 58
Cannot Connect to a Server 59
Problems with Network 59
System Boots when Installing PCI Card 60
Problems with Newly Installed Application Software 60
Problems with Application Software that Ran Correctly Earlier 61
Devices are not Recognized under Device Manager (Windows* Operating System) . 61
Hard Drive(s) are not Recognized 61
Bootable CD-ROM Disk Is Not Detected 62
LED Information 62
BIOS POST Beep Codes 62

Appendix D: System Issue Report Form 65

List of Figures

Figure 1. Intel® Workstation Board S5000XVN 1
Figure 2. Connector and Component Locations 4
Figure 3. Configuration Jumpers 7
Figure 4. Back Panel Connectors and LEDs 11
Figure 5. DIMM Sockets 16
Figure 6. BIOS Bank Select Jumper in Force Lower Bank Position 23
Figure 7. Passwrd Clr Jumper in Clear Password Position 24
Figure 8. CMOS Clr Jumper in the Clear CMOS Position 25
Figure 9. Locating DIMM Sockets 28
Figure 10. Installing FBDIMMs 29
Figure 11. Locating Processor Sockets 31
Figure 12. Opening Processor Socket Lever 32
Figure 13. Opening Load Plate 32
Figure 14. Removing Protective Cover from Load Plate 33
Figure 15. Setting Processor in Place 33
Figure 16. Installing Heatsink (passive heatsink shown) 35
Figure 17. Locating Active Heatsink Cable Connections 36
Figure 18. Opening Processor Socket Lever 38
Figure 19. Opening Load Plate 38
Figure 20. Removing Processor from Socket 39
Figure 21. Installing Protective Cover onto Load Plate 39
Figure 22. Locating and Removing the CMOS Battery 41

List of Tables

Table 1. Additional Information and Software viii
Table 2. Workstation Board Features 2
Table 3. NIC LEDs 11
Table 4. Setup Menu Key Use 20
Table 5. Heatsink Requirements for Compatible Intel® Server Chassis 34
Table 6. Product Certification Markings 48
Table 7. Resetting the System 53
Table 8. POST Error Beep Codes 62
Table 9. Error Beep Codes Generated by Intel® Remote Management Module 63

1 Workstation Board Features

This chapter briefly describes the main features of the Intel® Workstation Board S5000XVN. This chapter provides a photograph of the product, a list of the workstation board features, and diagrams showing the location of important components and connections on the workstation board.

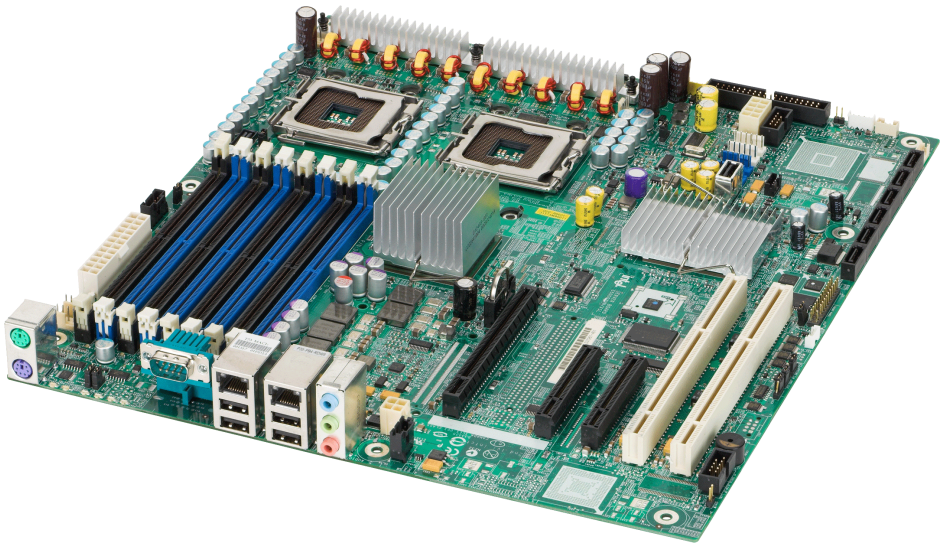


Figure 1. Intel® Workstation Board S5000XVN

Table 2 summarizes the features of the workstation board.

Table 2. Workstation Board Features

Feature	Description
Processor support	Support for up to two Dual-Core Intel® Xeon® processor 5000 sequence with a 677-, 1066-, or 1333-MHz front side bus
System memory support	• Eight FBDIMM sockets (DDR2-533 and DDR2-667) supporting 32 GB maximum memory • Quad-channel memory architecture
Intel® 5000X Chipset	• Intel® 6321ESB I/O Controller Hub • Intel® 5000X Memory Controller Hub
Cooling	Support for • Two processor fans (4-pin headers) • Four front fans (6-pin headers) • Two rear fans (4-pin header) 3-pin fans are compatible with all fan headers. 4-pin fans should be used only with the following fans: • CPU1 Fan • CPU2 Fan • Sys Fan 1 • Sys Fan 2 • Sys Fan 5 • Sys Fan 6 Sys Fan 3 and Sys Fan 4 are connected to the CPU1 PWM, which is programmed to work with the 4-pin active heatsink fans.
Add-in card slots	Five expansion slots: • One PCI-X* 64-bit / 100-MHz slot • One PCI-X* 64-bit / 100- / 133-MHz slot • Two PCI Express* x4 slots • One PCI Express x16 slot
Video support	• Use the PCI Express x16 slot to add the video card of your choice • Dual-video is supported
Hard drive and optical drive support	• Optical devices are supported • Ultra ATA-100 support: One IDE channel that is capable of supporting up to two drives • One of the following: — Product code S5000XVNSATA: Six SATA connectors at 3 GB/s — Product code S5000XVNSAS: Four SAS port connectors and two SATA port connectors, all at 3 GB/s
USB drive support	One internal USB port

Table 2. Workstation Board Features

Feature	Description
I/O control support	**External connections:** • PS/2* ports for keyboard and mouse • DB9 serial port A connection • One DH10 serial port B connector (optional) • Two RJ45 NIC connectors for 10/100/1000 Mb connections: Dual GbE through the Intel® 8256EB Network Connection • Four USB 2.0 ports at the back of the board **Internal connections:** • One 9-pin USB header that supports two external USB 2.0 ports • One internal USB port that supports a peripheral, such as a floppy drive • One DH10 serial port B header • One of the following: — Product code S5000XVNSATA: six SATA ports at 3 Gbs — Product code S5000XVNSAS: four SATA / SAS ports and two SATA ports at 3 Gbs • One ATA-100 40-pin connector • One SSI-compliant 24-pin front control panel header
RAID support	• One of the following: — Product code S5000XVNSATA: Intel® Embedded Server RAID Technology II provides SATA RAID 0, 1, and 10 with optional RAID 5 support provided by the Intel® RAID Activation Key AXXRAKSW5 ***Note:*** *The Intel® RAID Activation Key AXXRAKSW5 will be available post-launch.* — Product code S5000XVNSAS: Intel® Embedded Server RAID Technology II provides SAS/SATA RAID 0, 1, and 10 with optional RAID 5 support provided by the Intel® RAID Activation Key AXXRAKSW5 ***Note:*** *The Intel® RAID Activation Key AXXRAKSW5 will be available post-launch.*
Cooling fan support	• Two 4-pin processor fan connectors • Four 6-pin front fan connectors • Two 4-pin rear fan connectors
Management support	• Support for the Intel® Local Control Panel (optional component sold separately) • Support for Intel® System Management software • Intel® Light-Guided Diagnostics on field replaceable units
Audio	• Integrated audio with Realtec* ALC260 high-definition 2-channel audio

Connector and Header Locations

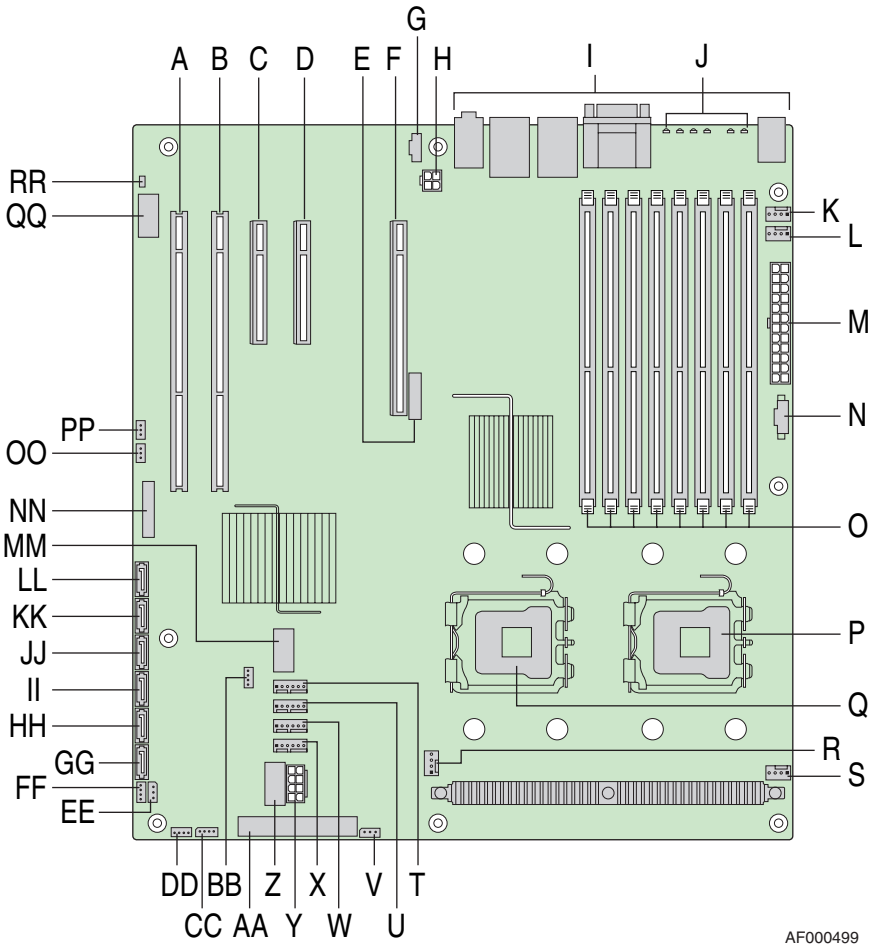
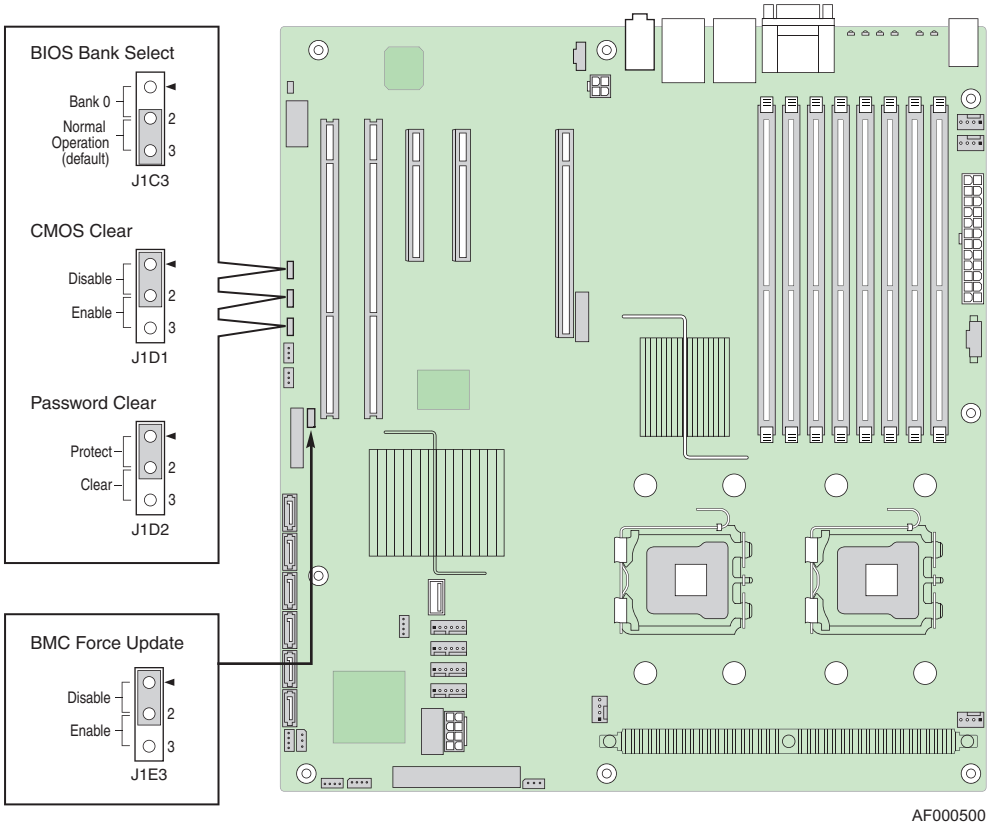


Figure 2. Connector and Component Locations

A.	PCI-X* 64-bit, 100-MHz slot 1	P.	Processor 1 socket	EE.	Enclosure management SAS SES (available only with product code S5000XVNSAS)
B.	PCI-X 64-bit, 100-/133-MHz slot 2	Q.	Processor 2 socket	FF.	Hot-swap backplane A header
C.	PCI Express* x4 slot 3	R.	Processor 2 fan header	GG.	SATA 0
D.	PCI Express x4 slot 4	S.	Processor 1 fan header	HH.	SATA 1

E. CMOS battery	T. System fan 4 header	II. SATA 2 or SAS 0 (SAS 0 is available only with product code S5000XVNSAS)
F. PCI Express x8 slot 6	U. System fan 3 header	JJ. SATA 3 or SAS 1 (SAS 1 is available only with product code S5000XVNSAS)
G. CD-ROM In connector	V. IPMB connector	KK. SATA 4 or SAS 2 (SAS 2 is available only with product code S5000XVNSAS)
H. P12V4 connector	W. System fan 2 header	LL. SATA 5 or SAS 3 (SAS 3 is available only with product code S5000XVNSAS)
I. Back panel I/O ports (see Figure 4 on page 11)	X. System fan 1 header	MM. USB port
J. Diagnostic and Identify LEDs (see Figure 4 on page 11)	Y. Processor power connector	NN. Front control panel header
K. System fan 6 header	Z. USB header	OO. SATA_Key: SATA RAID 5 key connector
L. System fan 5 header	AA. IDE connector	PP. SAS_Key: SAS RAID 5 key connector (available only with product code S5000XVNSAS)
M. Main power connector	BB. Enclosure management SATA GPIO header	QQ. Serial B / emergency management port header
N. Auxiliary power signal connector	CC. Hot-swap backplane B header	RR. Chassis intrusion header
O. DIMM sockets (see Figure 5 on page 16)	DD. Enclosure management SAS GPBIO header (available only with product code S5000XVNSAS)	

Configuration Jumpers



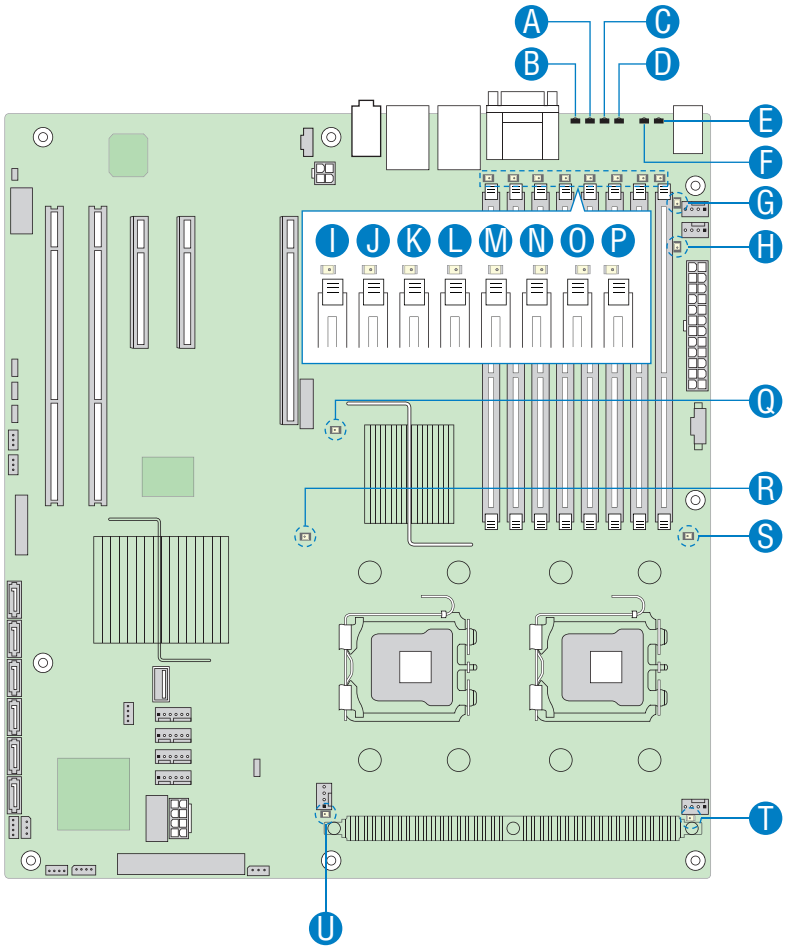
Jumper Name	Pins	What Happens at System Reset
BIOS Bank Select (J1C3)	1 - 2	Bank 0: Boot to an alternate BIOS.
	2 - 3	Boot from the standard BIOS. These pins should be jumpered for normal operation.
CMOS Clear (J1D1)	1 - 2	Protect CMOS: these pins should be jumpered for normal operation.
	2 - 3	Erase CMOS: If these pins are jumpered for 5 to 10 seconds, the CMOS settings will be cleared on the next workstation reset. These pins should not be jumpered for normal operation. ***Note:*** *The workstation does not need to be reset with the jumpers on these pins for the CMOS to be cleared. To clear the CMOS: Power down the workstation. Place the jumper on pins 2 - 3 for 5 to 10 seconds. Moving the jumper back to pins 1 - 2. Power on the workstation.*

Jumper Name	Pins	What Happens at System Reset
Password Clear (J1D2)	1 - 2	Protect password: These pins should be jumpered for normal operation.
	2 - 3	Erase password: If these pins are jumpered for 5 to 10 seconds, the password will be cleared on the next workstation reset. These pins should not be jumpered for normal operation. ***Note:*** *The workstation does not need to be reset with the jumpers on these pins for the password to be cleared. To use this jumper to reset the password: Power down the workstation. Place the jumper on pins 2 - 3 for 5 to 10 seconds. Move the jumper back to pins 1 - 2. Power on the workstation.*
BMC Force Update (J1E3)	1 - 2	Disable force update: These pins should be jumpered for normal operation.
	2 - 3	Enable force update: Jumpering these pins forces a BMC update.

Figure 3. Configuration Jumpers

Intel® Light-Guided Diagnostics

The workstation board contains diagnostic LEDs to help you identify failed and failing components and to help you identify the workstation from among several workstations. Except for the ID LED, the status LED, and the +5-volt standby LED, the LEDs turn on (amber) only if a failure occurs.



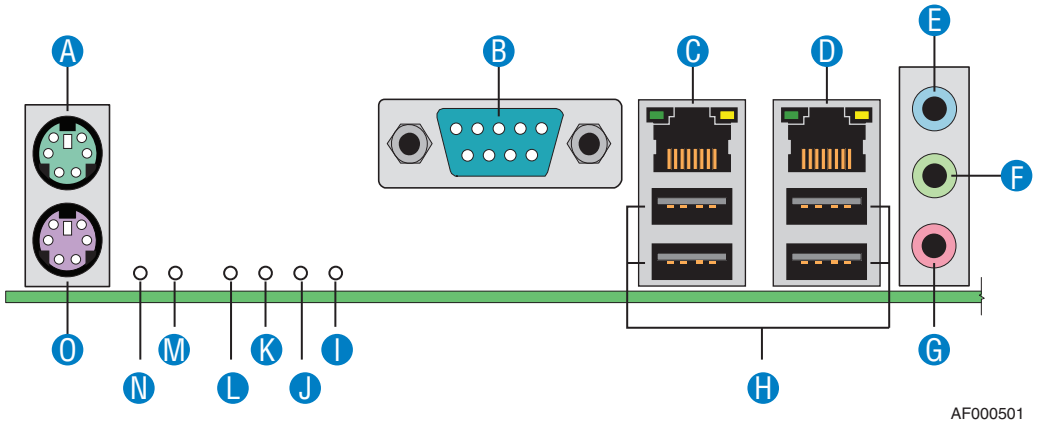
AF000502

Callout	LED	Function
A.	Bit 3 LED	POST LED. The sequence of lit POST LEDs is used to identify specific errors that might occur during the boot process. See the appendix of the Technical Product Specification for a description of how to read these LEDs.
B.	LSB LED	POST LED. The sequence of lit POST LEDs is used to identify specific errors that might occur during the boot process. See the appendix of the Technical Product Specification for a description of how to read these LEDs.
C.	Bit 2 LED	POST LED. The sequence of lit POST LEDs is used to identify specific errors that might occur during the boot process. See the appendix of the Technical Product Specification for a description of how to read these LEDs.
D.	MSB LED	POST LED. The sequence of lit POST LEDs is used to identify specific errors that might occur during the boot process. See the appendix of the Technical Product Specification for a description of how to read these LEDs.
E.	Status LED	The status LED indicates whether a system is operating correctly, has experienced a minor fault, or a major system error. For details about this LED, see the Technical Product Specification.
F.	ID LED	This LED can be turned on and off either by pressing a chassis button or by using system management software. This LED is useful when the system is grouped with several systems, such as in a rack, and you need to easily find the system to perform maintenance on it.
G.	System fan 6 fault LED	This LED indicates a fault has occurred with system fan 6. See your server chassis documentation for instructions to replace the fan.
H.	System fan 5 fault LED	This LED indicates a fault has occurred with system fan 5. See your server chassis documentation for instructions to replace the fan.
I.	DIMM A1 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_A1. Replace the faulty FBDIMM.
J.	DIMM A2 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_A2. Replace the faulty FBDIMM.
K.	DIMM B1 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_B1. Replace the faulty FBDIMM.

Callout	LED	Function
L.	DIMM B2 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_B2. Replace the faulty FBDIMM.
M.	DIMM C1 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_C1. Replace the faulty FBDIMM.
N.	DIMM C2 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_C2. Replace the faulty FBDIMM.
O.	DIMM D1 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_D1. Replace the faulty FBDIMM.
P.	DIMM D2 fault LED	This LED indicates a fault has occurred with the FBDIMM installed in socket DIMM_D2. Replace the faulty FBDIMM.
Q.	+5-volt standby LED	This LED is green whenever AC power is applied to the system. The system does not need to be powered on in order for this LED to be on.
R.	Processor 2 fault LED	This LED indicates a fault has occurred with the processor installed in socket CPU_2 socket. Replace the faulty processor.
S.	Processor 1 fault LED	This LED indicates a fault has occurred with the processor installed in socket CPU_1 socket. Replace the faulty processor.
T.	Processor 2 fan fault LED	This LED applies only to workstation systems that use an active heatsink. This LED indicates a fault has occurred with fan that is installed on the heatsink for processor 2. Replace the faulty unit.
U.	Processor 1 fan fault LED	This LED applies only to workstation systems that use an active heatsink. This LED indicates a fault has occurred with fan that is installed on the heatsink for processor 1. Replace the faulty unit.

Back Panel Features

The diagram and table show the back panel connectors and LEDs. For information about the LEDs, see "Intel® Light-Guided Diagnostics" on page 8.



A.	Mouse	I.	LSB LED (POST LED)
B.	Serial A	J.	Bit 1 LED (POST LED
C.	NIC 1	K.	Bit 2 LED (POST LED)
D.	NIC 2	L.	MSB LED (POST LED)
E.	Audio in	M.	ID LED
F.	Audio out	N.	Status LED
G.	Microphone	O.	Keyboard
H.	USB (four ports)		

Figure 4. Back Panel Connectors and LEDs

The NIC LEDs at the right and left of each NIC provide the following information.

Table 3. NIC LEDs

LED	LED State	Description
Left	Off	No network connection is in place
	Solid green	Active network connection is in place
	Blinking green	Transmit / receive activity is occurring
Right	Off	10 Mbps connection (if left LED is on or blinking)
	Solid green	100 Mbps connection
	Solid amber	1000 Mbps connection

RAID Support

The Intel® Workstation Board S5000XVN is available in a SATA model and a SAS model.

- The SATA model has product code S5000XVNSATA.
- The SAS model has product code S5000XVNSAS.

The SAS model provides both SAS and SATA support; the SATA model provides only SATA support. For information on configuring RAID, see the RAID software user's guide that is included on the *Intel® Server Deployment Toolkit 2.0 CD*.

SATA Workstation Board

The Intel® Workstation Board S5000XVN provides an embedded SATA controller that supports both 1.5 and 3.0 Gbps data transfer rates.

The BIOS Setup utility provides multiple drive configuration options on the Advanced | ATA Controller setup page, some of which affect the ability to configure RAID. The "Onboard SATA Controller" option is enabled by default. When this option is enabled, the "SATA Mode" option can be set to either Legacy or Enhanced. The Legacy and Enhanced modes affect the RAID configuration as follows:

- Legacy supports four disk drives and does not provide RAID support.
- Enhanced supports six disk drives and is required for RAID configurations.

When the enhanced mode is selected, you can choose to enable or disable "AHCI Mode" or "Configure SATA as RAID". Intel® Embedded Server RAID Technology II is enabled by the option, "Configure SATA as RAID." The Intel® Embedded Server RAID Technology II feature provides RAID modes 0, 1, and 10.

For RAID 0, 1, and 10, enclosure management is provided through the SATA_SGPIO connector on the workstation board when a cable is attached between this connector on the workstation board and to the backplane or I^2C interface.

If RAID 5 is desired, the optional Intel® RAID Activation Key AXXRAKSW5 can be installed. To enable RAID 5, this activation key is placed on the SATA_Key connector that is located at the left side of the workstation board. For information on how to install the Intel® RAID Activation Key AXXRAKSW5 accessory to enable RAID 5, see the documentation that is included with the accessory kit. See Figure 2 on page 4 for connection locations.

Note: *For assistance in navigating through the BIOS Setup utility, see the Intel® Workstation Board S5000XVN Technical Product Specification.*

SAS Workstation Board

In addition to the SATA features described above, SAS models of the workstation board (product code S5000XVNSAS) also have a dual-mode 4-port Serial Attached SCSI (SAS) controller that supports both SAS and SATA hard disk drives. This controller is capable of data transfer rates of up to 3.0 Gbps per port.The SAS controller supports up to 120 physical drives when expanders are used.

The BIOS Setup utility includes options on the Advanced | Mass Storage setup page to enable or disable the SAS option ROM and the SAS controller. Both of these options must be enabled to use RAID.

- When the SAS controller is enabled, the two black SATA ports on the workstation board continue to function as SATA ports. The four blue ports can be used as either SAS or SATA ports. When the SAS controller is disabled in the BIOS Setup utility, SATA ports 0 and 1 (the two black ports) function as SATA ports and all other SAS / SATA ports are disabled.
- When the SAS option ROM is enabled in the BIOS Setup utility, Intel® Embedded Server RAID Technology II is available. This enables SAS RAID modes 0, 1, or 10 for the four blue ports on the workstation board. These SAS controller can mix SAS and SATA drives.

If the SAS option ROM is disabled in the BIOS Setup utility, but the SAS controller is enabled, the four blue ports on the workstation board continue to function as either SAS or SATA ports and the two black ports on the workstation board continue to function as SATA-only ports. However, RAID support is not available.

Both SAS and SATA controllers support SGPIO enclosure management. Two SGPIO connectors are available on SAS models of the workstation board, one for the SAS controller and one for the SATA controller.

If RAID 5 is desired, the optional Intel® RAID Activation Key AXXRAKSW5 can be installed. To enable RAID 5, this activation key is placed on the SAS_Key connector that is located at the left side of the workstation board. For information on how to install the Intel® RAID Activation Key AXXRAKSW5 accessory to enable RAID 5, see the documentation that is included with the accessory kit. See Figure 2 on page 4 for connection locations.

Note: *For assistance in navigating through the BIOS Setup utility, see the Intel® Workstation Board S5000XVN Technical Product Specification.*

Audio Support

The Intel® Workstation Board S5000XVN includes the Realtec* ALC260 2-channel high-definition audio codec with universal audio architecture. It features a 24-bit, 2-channel DAC and two stereo 20-bit ADCs.

The ALC260 provides two output channels with flexible mixing, mute and fine gain controls to provide a complete integrated audio solution. The ALC260 provides high-quality audio using S/PDIF to output analog data or multiple-source recording applications. Jack sensing allows inputs and output device loads to be auto-detected. Analog IOs are both input and output capable. The ALC260 supports 32-bit S/PDIF input/output functions.

The feature list for the ALC260 is as follows:

- Single-chip multi-bit Sigma-Delta converters with high S/N ratio
- One stereo DAC that supports 16/20/24-bit PCM format with 44.1K/48K/96K/192kHz sample rate
- Two stereo ADCs that support 16/20-bit PCM format with 44.1K/48K/96kHz sample rate
- Applicable for 2-channel 192kHz DVD audio solutions
- Line out, HP out, line 1, line 2, mic 1, and mic 2 are stereo input and output re-tasking
- Mono line level output to subwoofer speaker for 2.1 channel applications
- High-quality differential CD analog input
- Two jack detection pins, each designed to detect four jacks
- Support for 44.1K/48K/96kHz/192kHz S/PDIF output
- Support for 44.1K/48K/96kHz S/PDIF input
- Reserve analog mixer architecture is backwards compatible with AC'97*
- –64dB ~ +30dB with 1dB mixer gain for fine volume control
- Impedance-sensing capability for each re-tasking jack
- Built-in headphone amplifier for each re-tasking jack
- Supports GPIOs (general-purpose input/output) for customized applications
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- Emulation of 26 sound environments to enhance gaming experience
- 10-band software equalizer
- Enhanced configuration panel and device sensing wizard to improve user experience
- Content copy protection for S/PDIF interface
- Mono / stereo microphone noise suppression

Hardware Requirements

To avoid integration difficulties and possible board damage, your system must meet the requirements outlined below. For a list of qualified components, see the links under "Additional Information and Software" on page viii.

Processor

One or two Dual-Core Intel®Xeon® processors 5000 sequence. For a list of supported processors, see the links under "Additional Information and Software".

Memory

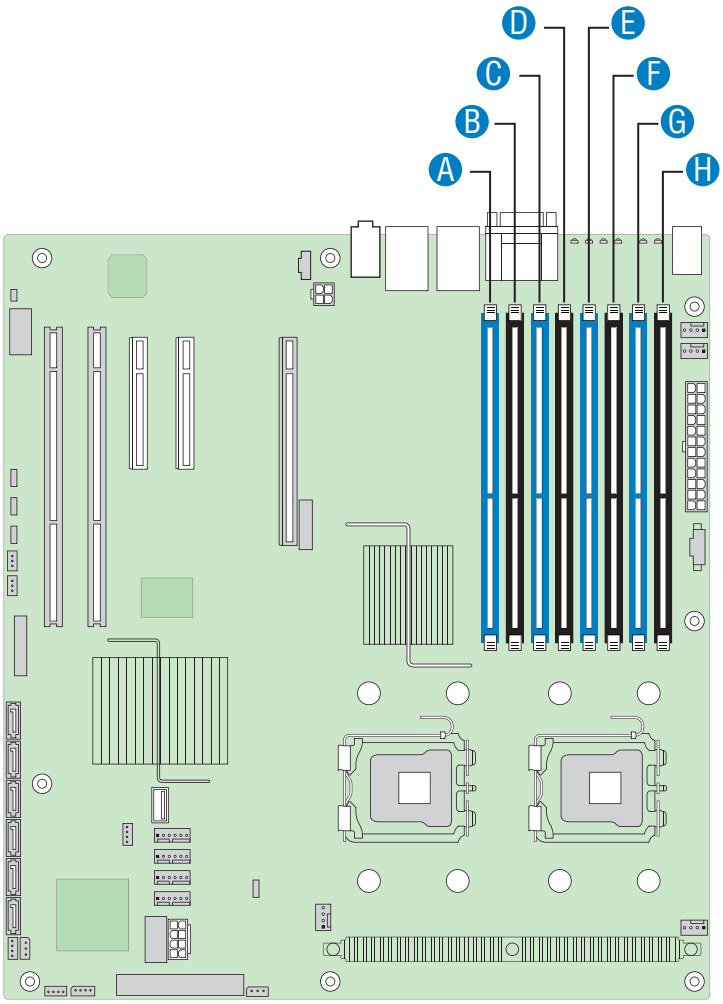
The Intel® Workstation Board S5000XVN provides eight DIMM sockets in two branches. Each branch contains two channels:

- Branch 1 contains Channel A and Channel B
- Branch 2 contains Channel C and Channel D

Each channel contains two DIMM sockets:

- Channel A, nearest to the center of the workstation board, consists of DIMM sockets A1 and A2
- Channel B consists of DIMM sockets B1 and B2
- Channel C consists of DIMM sockets C1 and C2
- Channel D consists of DIMM sockets D1 and D2

See the following diagram to identify the DIMM sockets.



Callout	DIMM Socket	Callout	DIMM Socket
A.	Branch 1, Channel A, DIMM_A1	E.	Branch 2, Channel C, DIMM_C1
B.	Branch 1, Channel A, DIMM_A2	F.	Branch 2, Channel C, DIMM_C2
C.	Branch 1, Channel B, DIMM_B1	G.	Branch 2, Channel D, DIMM_D1
D.	Branch 1, Channel B, DIMM_B2	H.	Branch 2, Channel D, DIMM_D2

Figure 5. DIMM Sockets

A minimum of one 512 MB FBDIMM is required in DIMM socket DIMM_A1. FBDIMMs must meet the following requirements:

- Use only FBDIMMs (DDR2-533 or DDR2-667).
- Use only 240-pin FBDIMMs.
- Use FBDIMMs with capacities of 512 MB, 1 GB, 2 GB, or 4 G.
- Use only FBDIMMs that comply with the JEDEC Rev 2.0 specifications.
- FBDIMMs in a given channel must be identical with respect to manufacturing, speed, timing, and organization. For example, this means the FBDIMMs in sockets A1 and B1 must be identical, and the FBDIMMs in sockets C1 and D1 must be identical. FBDIMMs in adjacent sockets on the same channel do not need to be identical.

The workstation will run in single-channel mode under the following conditions:

- Only a single FBDIMM is installed. This FBDIMM must be in socket DIMM_A1.
- The population of socket DIMM_A1 determines the mode that is selected. If DIMM_A1 and DIMM_B1 are not identical, then the system reverts to single-channel mode and DIMM_B1 is disabled.
- If the FBDIMMs in socket positions on adjacent channels of the branch are different in terms of timing, technology, or size. If the FBDIMMs on adjacent channels of a branch are not identical, the FBDIMM on the higher channel is disabled.
- If Branch 0 cannot support the dual-channel mode of operation for any reason, the workstation will run in single-channel mode.

For dual-channel interleave, providing optimum performance, a minimum of two FBDIMMs must be installed. Populate FBDIMMs of the same size in each channel. Install these FBDIMMs in DIMM sockets DIMM_A1 and DIMM_B1. For dual-channel interleave, FBDIMMs must be installed in pairs and populated as follows:

- DIMM_A1 and DIMM_B1: Populate these two sockets together first.
- Populate FBDIMMs in channel order, populating all FBDIMMs in each channel. For example, if four FBDIMMs are to be installed, they need to be in sockets A1, B1, C1, and D1.
- The minimum memory population for enabling Branch 1 is four FBDIMMs: DIMM_A1, DIMM_B1, DIMM_C1 and DIMM_D1.

During the boot process, FBDIMMs that do not meet the population requirements are disabled.

For a complete list of supported memory FBDIMMs, see the links under "Additional Information and Software" on page viii

Power Supply

A minimum of 550 watts is required. Your power supply must provide a minimum of 3 amps of 5-volt standby current or the workstation will not boot.

Optional Hardware

Intel® RAID Activation Key

The Intel® RAID Activation Key AXXRAKSW5 can be purchased and installed to enable RAID 5 support on your workstation board. For the SATA workstation board, product code S5000XSLSATA, an Intel® RAID Activation Key can be installed in the SATA RAID 5 Key connector. For the SAS workstation board, product code S5000XSLSAS, an Intel® RAID Activation Key can be installed in either the SATA RAID 5 Key connector, the SAS RAID 5 Key connector, or in each of these connectors.

For information about RAID support on this workstation board, see "RAID Support" on page 12. See Figure 2 on page 4 to locate the connectors on the workstation board. Installation instructions for the RAID Activation Key are included with the accessory.

Hard Disk Drives

The Intel® Workstation Board S5000XVN supports different hard disk drive options, depending on the version of the workstation board purchased.

- Optical hard disk drives
- Serial ATA (SATA) and (SAS):
  - Product code S5000XVNSATA: Six SATA ports at 3 GB/s, no SAS ports
  - Product code S5000XVNSAS: Four SAS/SATA ports, two SATA ports at 3 GB/s
- Parallel ATA (IDE): The workstation board includes one IDE connector.

See the documentation included with your server chassis for additional drive information and drive installation instructions.

Intel® Local Control Panel

The Intel® Local Control Panel provides enhanced system control by utilizing a LCD display, which provides additional controls and indicators beyond the standard control panel.

2 System Utilities

Using the BIOS Setup Utility

This section describes the BIOS Setup Utility options, which is used to change system configuration defaults. You can run BIOS Setup with or without an operating system being present. See “Additional Information and Software” for a link to the Technical Product Specification where you will find details about specific BIOS setup screens.

Starting Setup

You can enter and start BIOS Setup under several conditions:

- When you turn on the workstation, after POST completes the memory test.
- When you have moved the CMOS jumper on the workstation board to the “Clear CMOS” position (enabled).

In the two conditions listed above, during the Power On Self Test (POST), you will see this prompt:

```
Press <F2> to enter SETUP
```

In a third condition, when CMOS/NVRAM has been corrupted, you will see warning prompts but not the <F2> prompt:

```
Warning: CMOS checksum invalid
Warning: CMOS time and date not set
```

In this condition, the BIOS will load default values for CMOS and attempt to boot.

If You Cannot Access Setup

If you are not able to access BIOS Setup, you might need to clear the CMOS memory. For instructions on clearing the CMOS, see “Clearing the CMOS” on page 25.

Setup Menus

The BIOS Setup utility provides multiple pages to allow you to view and change system settings. Some parameters are configured automatically and cannot be changed. If an administrator password has been set, administrator privileges are required to change most settings. If a value cannot be changed for any reason, the feature's value field is inaccessible.

The following table describes the keyboard commands you can use in the BIOS Setup menus.

Table 4. Setup Menu Key Use

Key to Press	Description
<F1>	Pressing <F1> on any menu invokes the general help window.
Left and right arrows	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a submenu or pick list is displayed.
Up arrow	Select Item up - The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Pressing the <Enter> key activates the selected item.
Down arrow	Select Item down - The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Pressing the <Enter> key activates the selected item.
<F5> or <->	Change Value - The minus key or the <F5> function key is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
<F6> or <+>	Change Value - The plus key or the <F6> function key is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but it has the same effect.
<Enter>	Execute Command - The <Enter> key is used to activate submenus when the selected feature is a submenu, or to display a pick list if a selected feature has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the <Enter> key will undo the pick list, and allow another selection in the parent menu.
<Esc>	Exit - The <Esc> key provides a mechanism for backing out of any field. This key will undo the pressing of the <Enter> key. When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When the <Esc> key is pressed in any submenu, the parent menu is re-entered. When the <Esc> key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded.

Table 4. Setup Menu Key Use

Key to Press	Description

<F9>	Setup Defaults - Pressing <F9> causes the following to appear:
	`Setup Confirmation`
	`Load default configuration now?`
	`[Yes] [No]`
	If "Yes" is selected and the <Enter> key is pressed, all Setup fields are set to their default values. If "No" is selected and the <Enter> key is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <F9> was pressed without affecting any existing field values.

<F10>	Save and Exit - Pressing <F10> causes the following message to appear:
	`Setup Confirmation`
	`Save Configuration changes and exit now?`
	`[Yes] [No]`
	If "Yes" is selected and the <Enter> key is pressed, all changes are saved and Setup is exited. If "No" is selected and the <Enter> key is pressed, or the <Esc> key is pressed, the user is returned to where they were before <F10> was pressed without affecting any existing values.

Upgrading the BIOS

The upgrade utility allows you to upgrade the BIOS in flash memory. The code and data in the upgrade file include the following:

- On-board system BIOS, including the recovery code, BIOS Setup utility, and strings.
- On-board video BIOS and other option ROMs for devices embedded on the workstation board.
- OEM binary area
- Microcode
- A way to change the BIOS language

When you perform an upgrade to your BIOS, the upgrade is performed into a secondary BIOS partition on specialized workstation board hardware. When you boot your workstation, the system checks for an upgraded BIOS in this secondary partition. If it finds a BIOS upgrade has been installed, it attempts to boot with the new BIOS. If it encounters a problem with the upgraded BIOS, the system reverts to the BIOS that was in place before the upgrade was performed. This provides a safeguard against problems that might happen during the upgrade, such as a power outage during the upgrade process. This is called the rolling BIOS feature.

Preparing for the Upgrade

The steps below explain how to prepare to upgrade the BIOS, including how to record the current BIOS settings and how to obtain the upgrade utility.

Note: *In the unlikely event that a BIOS error occurs during the BIOS update process, a recovery process may need to be followed to return the system to service. See "Additional Information and Software" on page viii for a link to necessary software and instructions.*

Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the message:
   `Press <F2> Key if you want to run SETUP`
2. Write down the current settings in the BIOS Setup program.

Note: *Do not skip step 2. You will need these settings to configure your computer at the end of the procedure.*

Obtaining the Upgrade

Download the BIOS image file to a temporary folder on your hard drive. See "Additional Information and Software" for a link to the update software.

Note: *Review the instructions and release notes that are provided in the readme file distributed with the BIOS image file before attempting a BIOS upgrade. The release notes contain critical information regarding jumper settings, specific fixes, or other information to complete the upgrade.*

Upgrading the BIOS

Follow the instructions in the readme file that came with the BIOS upgrade. When the update completes, remove the bootable media from which you performed the upgrade.

Caution: *Do not power down the system during the BIOS update process!*

Note: *You may encounter a CMOS Checksum error or other problem after reboot. If this happens, shut down the system and boot it again. CMOS checksum errors require that you enter Setup, check your settings, save your settings, and exit Setup.*

Reverting to the Previous BIOS

If you encounter a problem with your BIOS, you may want to revert to the previously installed BIOS. Because of the rolling BIOS feature, your workstation contains two versions of the BIOS: the current BIOS, and the BIOS that was previously installed.

Note: *If you upgrade the BIOS more than once with the same BIOS version, the two versions of the BIOS stored in your workstation will be identical.*

To revert to the previous BIOS:

1. Power down the workstation and disconnect the AC power.
2. Open the chassis. See your chassis documentation for instructions on removing the chassis cover.
3. Locate the BIOS Bank Select jumper at board position J1C3. See Figure 6.
4. Move the jumper from the normal operation position, covering pins 2 and 3, to the Bank_0 position, covering pins 1 and 2, as shown by the diagram.

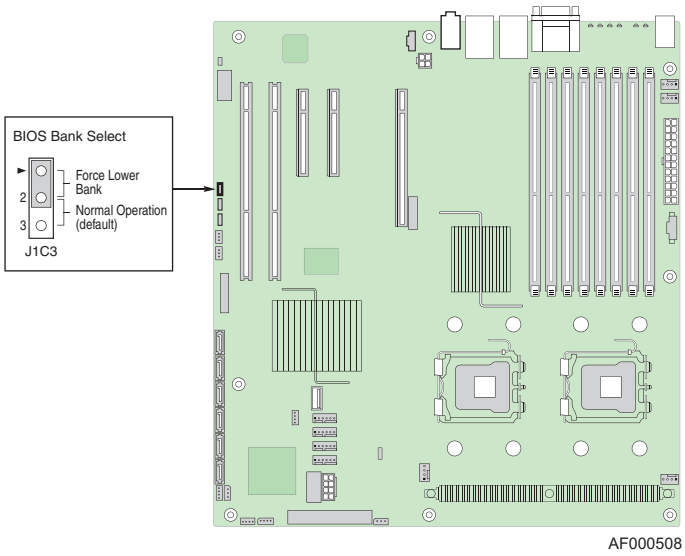


Figure 6. BIOS Bank Select Jumper in Force Lower Bank Position

5. Close the chassis.
6. Reconnect the AC power and power up the workstation.

The BIOS will boot to the previous BIOS until you either move the jumper again or until you perform another BIOS update.

Clearing the Password

If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the “clear” position clears both passwords. The password clear jumper must be restored to its original position before a new password(s) can be set.

1. Power down the system. Leave the AC power cord connected.
2. Open the chassis. See your chassis documentation for instructions on removing the chassis cover.
3. Locate the Passwrd Clr jumper block at board position J1D2. See Figure 7.
4. Move the jumper from the normal operation position, covering pins 1 and 2, to the Password Clear position, covering pins 2 and 3, as shown by the diagram.

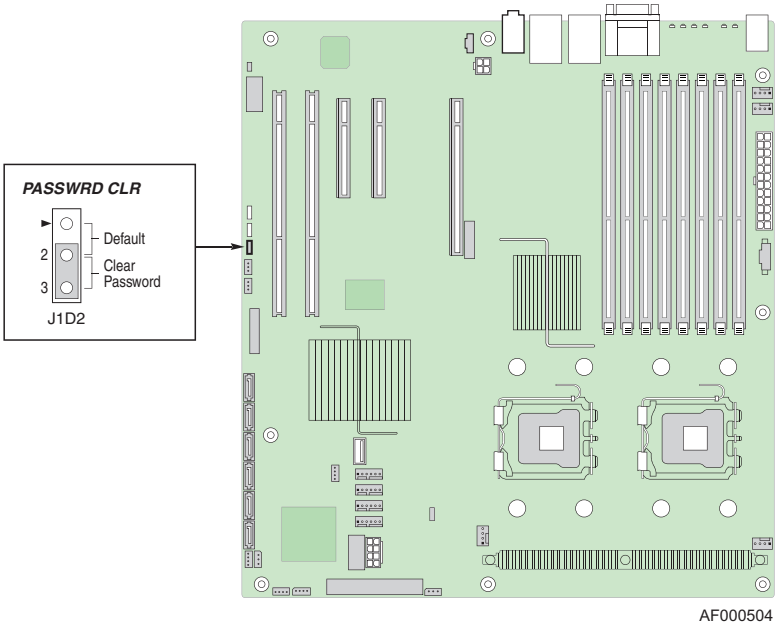


Figure 7. Passwrd Clr Jumper in Clear Password Position

5. Wait 10 seconds.
6. Move the Passwrd Clear jumper back to the original position, covering pins 1 and 2.
7. Close the chassis.
8. Power up the workstation.

Clearing the CMOS

If you are not able to access the BIOS setup screens, the CMOS Clear jumper will need to be used to reset the configuration RAM.

1. Power down the system. Leave the AC power cord connected.
2. Open the chassis. See your chassis documentation for instructions on removing the chassis cover.
3. Locate the CMOS Clr jumper block at board position J1D1. See Figure 8.
4. Move the jumper from the normal operation position, covering pins 1 and 2, to the CMOS Clear position, covering pins 2 and 3, as shown by the diagram.

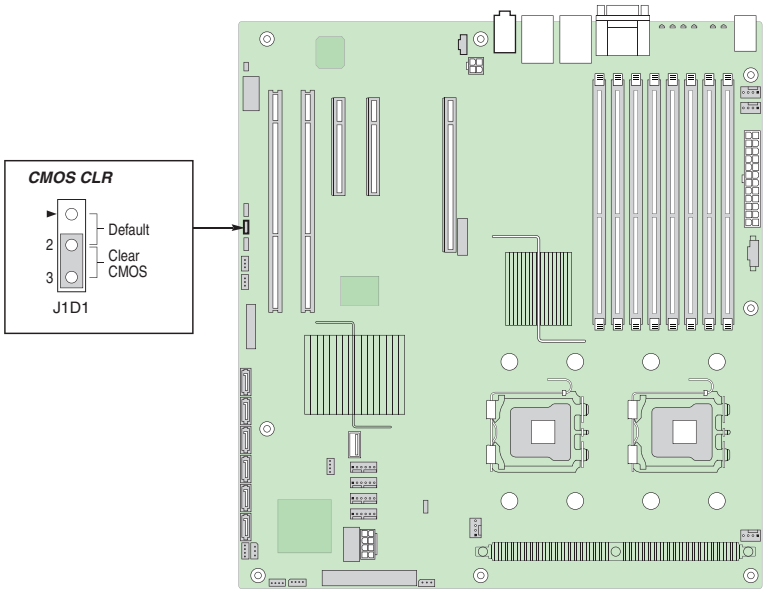


Figure 8. CMOS Clr Jumper in the Clear CMOS Position

5. Wait 10 seconds.
6. Move the CMOS Clear jumper back to the original position, covering pins 1 and 2.
7. Close the chassis.
8. Power up the workstation.

3 Hardware Installations and Upgrades

Before You Begin

Before working with your workstation product, pay close attention to the "Safety Information" on page iii.

Tools and Supplies Needed

- Phillips* (cross head) screwdriver (#1 bit and #2 bit)
- Needle nosed pliers
- Antistatic wrist strap and conductive foam pad (recommended)

Installing and Removing Memory

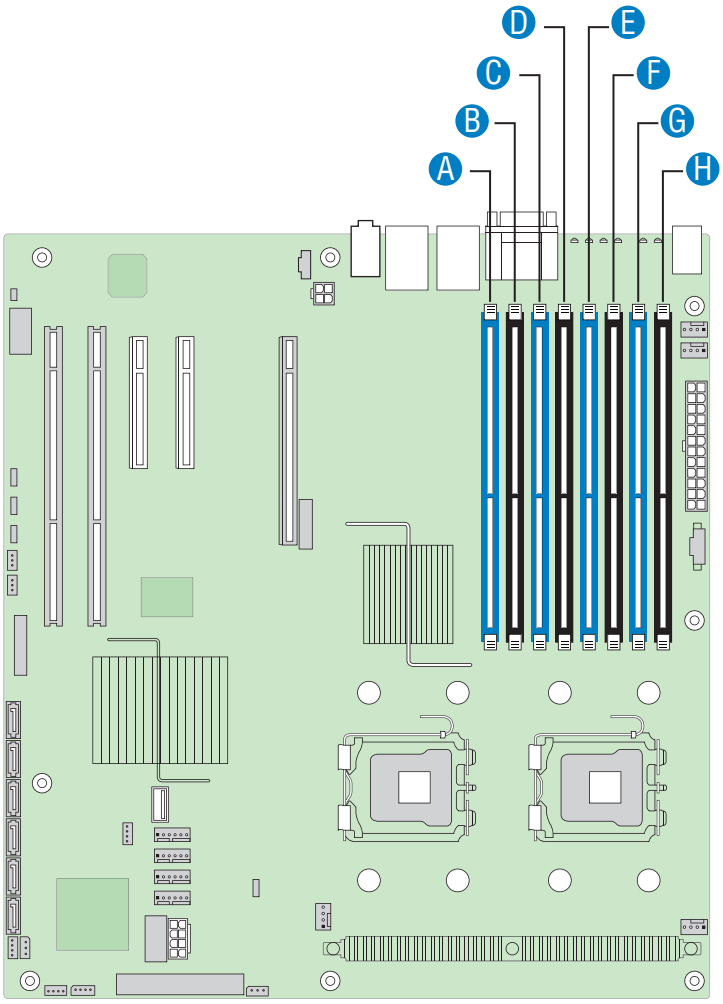
The silkscreen on the board for the FBDIMMs displays DIMM_A1, DIMM_A2, DIMM_B1, DIMM_B2, DIMM_C1, DIMM_C2, DIMM_D1, and DIMM_D2, starting from the inside of the board. DIMM_A1 is the socket closest to the MCH. See "Memory" on page 15 for a discussion of the memory requirements and options. See "Additional Information and Software" on page viii for a link to the list of tested FBDIMMs.

Installing FBDIMMs

To install FBDIMMs, follow these steps:

1. Observe the safety and ESD precautions in "Safety Information" on page iii.
2. Turn off all peripheral devices connected to the workstation. Turn off the workstation.
3. Disconnect the AC power cord from the workstation.
4. Remove the chassis cover. See the documentation that came with your chassis for instructions on removing the cover.

5. Locate the DIMM sockets (see Figure 9).
6. Disconnect and remove any components necessary to access the DIMM sockets. See the documentation that came with your chassis for instructions on removing chassis components.



Callout	DIMM Socket	Callout	DIMM Socket
A.	DIMM_A1	E.	DIMM_C1
B.	DIMM_A2	F.	DIMM_C2
C.	DIMM_B1	G.	DIMM_D1
D.	DIMM_B2	H.	DIMM_D2

Figure 9. Locating DIMM Sockets

7. Make sure the clips at each end of the DIMM socket(s) are pushed outward to the open position. See letter “A” in Figure 10.
8. Holding the FBDIMM by the edges, remove it from its anti-static package.
9. Position the FBDIMM above the socket. Align the notch on the bottom edge of the FBDIMM with the key in the DIMM socket. The arrow for letter “B” in Figure 10 is pointing to the key in the socket.
10. Insert the bottom edge of the FBDIMM into the socket.
11. When the FBDIMM is inserted, push down on the top edge of the FBDIMM until the retaining clips snap into place. See letter “C” in Figure 10.
12. Make sure the clips latch firmly in place. See letter “D” in Figure 10.

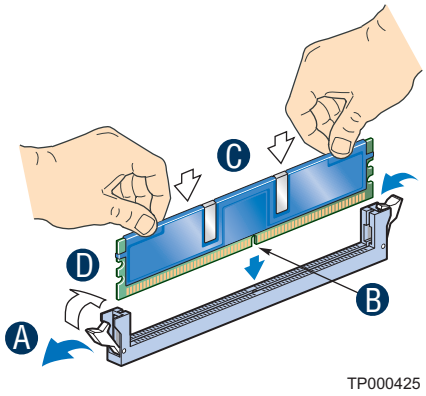


Figure 10. Installing FBDIMMs

13. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets. See the documentation that came with your chassis for instructions on removing chassis components.
14. Replace the chassis cover and reconnect the AC power cord. See the documentation that came with your chassis for instructions on installing the chassis cover.

Removing FBDIMMs

To remove a FBDIMM, follow these steps:

1. Observe the safety and ESD precautions in "Safety Information" on page iii.
2. Turn off all peripheral devices connected to the workstation. Turn off the workstation.
3. Remove the AC power cord from the workstation.
4. Remove the chassis cover. See the documentation that came with your chassis for instructions on removing the cover.
5. Disconnect and remove any components necessary to access the DIMM sockets. See the documentation that came with your chassis for instructions on removing chassis components.
6. Push the clips at each end of the DIMM socket(s) outward to the open position. The FBDIMM lifts from the socket.
7. Holding the FBDIMM by the edges, lift it from the socket. Store the FBDIMM in an anti-static package.
8. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets. See the documentation that came with your chassis for instructions on installing chassis components.
9. Replace the chassis cover and reconnect the AC power cord. See the documentation that came with your chassis for instructions on installing the cover.

Installing or Replacing the Processor

Caution: *Processor must be appropriate: You may damage the workstation board if you install a processor that is inappropriate for your workstation. See "Additional Information and Software" on page viii for a link to the list of compatible processor(s).*

Caution: *ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor or workstation board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.*

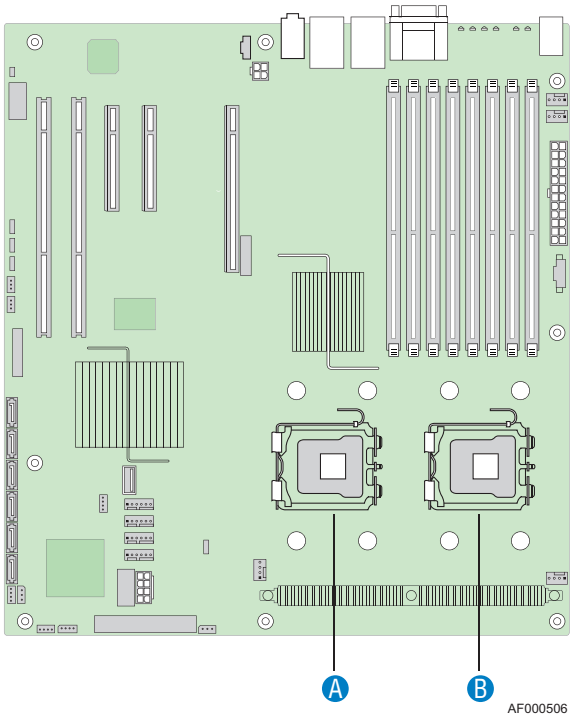
Installing the Processor

Notes:

- *Do not touch the contacts on either the processor or the processor socket.*
- *Do not force the processor socket into place. When correctly aligned, the socket will easily drop into place.*

To install a processor, follow these instructions:

1. Observe the safety and ESD precautions in "Safety Information" on page iii.
2. Turn off all peripheral devices connected to the workstation. Turn off the workstation.
3. Disconnect the AC power cord from the workstation.
4. Remove the chassis cover. See the documentation that came with your chassis for instructions on removing the cover.
5. Locate the processor sockets (see Figure 11).



Callout	Processor Socket	Callout	Processor Socket
A.	CPU_2	B.	CPU_1

Figure 11. Locating Processor Sockets

6. Disconnect and remove any components necessary to access the processor sockets. See the documentation that came with your chassis for instructions on removing chassis components.
7. Push down on the lever attached to the processor socket. While holding the lever down, pull it towards the center of the board to disengage the lever from the hook. Fully open the lever. See Figure 12.

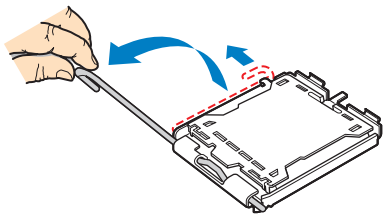


Figure 12. Opening Processor Socket Lever

8. Push down on the rear tab of the load plate to swing the front of the load plate up slightly. Fully open the load plate. See Figure 13.

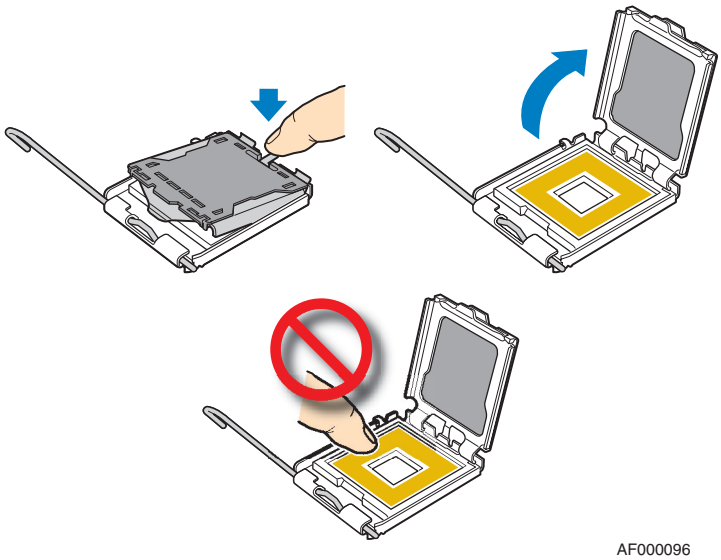


Figure 13. Opening Load Plate

9. If the protective cover is attached from the load plate, remove it and store it for future use.

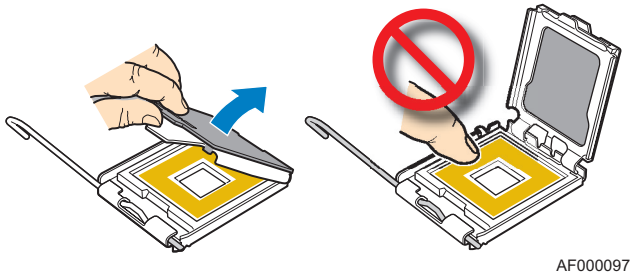


Figure 14. Removing Protective Cover from Load Plate

10. Remove the processor from the box and remove the protective shipping cover.
11. Set the processor in the socket with the processor cutouts matching the processor socket notches. See Figure 15.

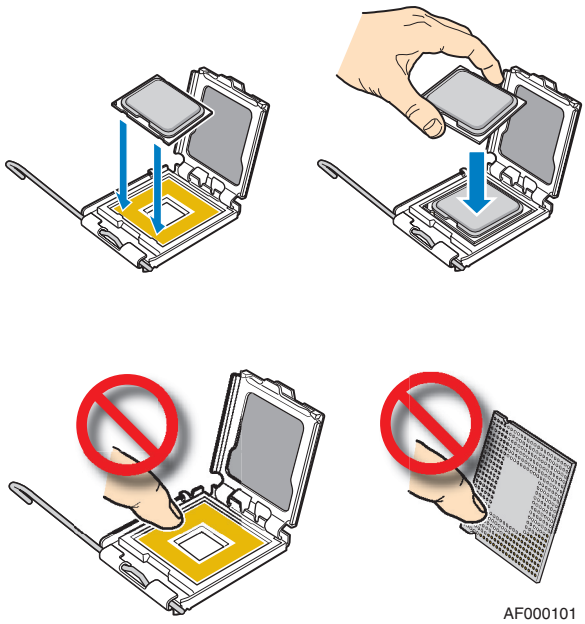


Figure 15. Setting Processor in Place

12. Close the load plate.
13. Close the socket lever. Push downward on the socket lever while pushing it toward the center of the to engage it under the hook on the processor socket.
14. Install the heatsink(s). See "Installing the Heatsink(s)" on page 34 for instructions.

Installing the Heatsink(s)

Note: *The heatsink has thermal interface material (TIM) located on the bottom of it. Use caution when handling the heatsink so you do not damage the TIM.*

Each processor requires a heatsink. Depending on your chassis, you may need to use either a passive or an active heatsink. An active heatsink has a fan attached to the top of it and a cable that needs to be connected to the workstation board. The following table shows the Intel® server chassis compatible with this workstation board and whether each chassis requires an active or a passive heatsink:

Table 5. Heatsink Requirements for Compatible Intel® Server Chassis

Server Chassis	Heatsink Requirement
Intel® Entry Server Chassis SC5299-E WS	Active heatsink
Intel® Server Chassis SC5400 Base	Passive heatsink

Use the following steps to install a heatsink.

1. Install the processor. See "Installing the Processor" on page 31 for instructions.
2. Set the heatsink over the processor, lining up the four captive screws with the four posts surrounding the processor.
3. Loosely screw in the captive screws on the heat sink corners in the order shown by Figure 16. Do not fully tighten one screw before loosely attaching the others.
4. In the same order, gradually and equally tighten each captive screw until each is firmly tightened. Do not fully tighten one screw at a time.

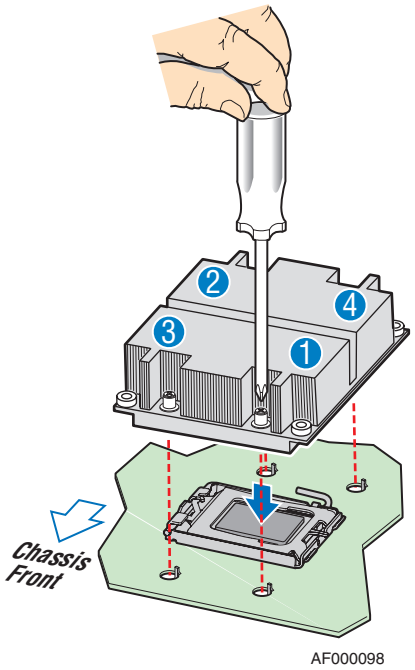
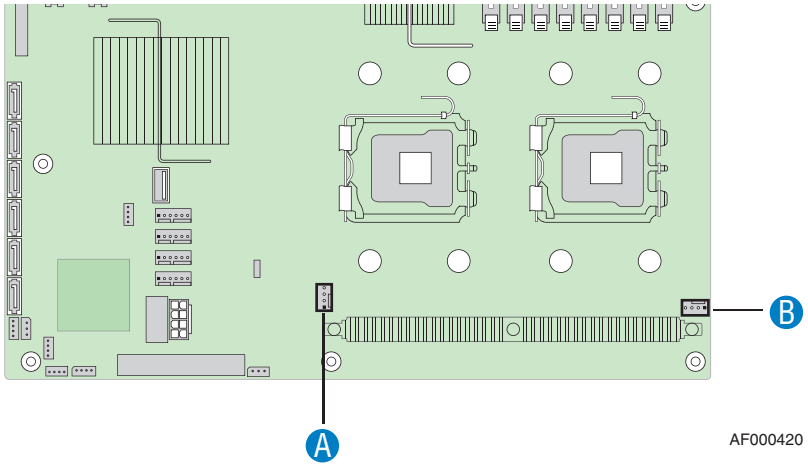


Figure 16. Installing Heatsink (passive heatsink shown)

5. Active heatsink only: Connect the heatsink cable to the workstation board.



Callout	Processor Heatsink Connector	Callout	Processor Heatsink Connector
A.	CPU_2	B.	CPU_1

Figure 17. Locating Active Heatsink Cable Connections

6. Reinstall and reconnect any parts you removed or disconnected to reach the processor sockets. See the documentation that came with your chassis for instructions on installing chassis components.
7. Replace the chassis cover and reconnect the AC power cord. See the documentation that came with your chassis for instructions on installing the cover.

Removing a Processor

1. Observe the safety and ESD precautions in "Safety Information" on page iii.
2. Turn off all peripheral devices connected to the workstation. Turn off the workstation.
3. Remove the AC power cord from the workstation.
4. Remove the chassis cover. See the documentation that came with your chassis for instructions on removing the cover.
5. Disconnect and remove any components necessary to access the processor sockets. See the documentation that came with your chassis for instructions on removing chassis components.
6. Active heatsink only: Unplug the processor fan cable from the workstation board.
7. Loosen the four captive screws on the corners of the heat sink.
8. Twist the heat sink slightly to break the seal between the heat sink and the processor.
9. Lift the heat sink from the processor. If it does not pull up easily, twist the heat sink again. Do not force the heat sink from the processor. Doing so could damage the processor.

Caution:

— D*o not attempt to operate your workstation system without a heatsink installed over each installed processor. Doing so will cause your workstation to overheat and may cause permanent damage.*

— *The heatsink has Thermal Interface Material (TIM) located on the bottom of it. Use caution when handling the heatsink so you do not damage the TIM.*

10. Push down on the lever attached to the processor socket. While holding the lever down, pull it towards the center of the board to disengage the lever from the hook. Fully open the lever. See Figure 18.

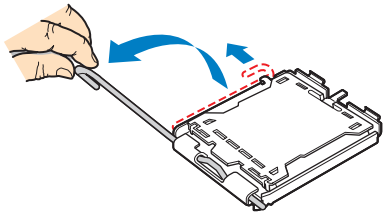


Figure 18. Opening Processor Socket Lever

11. Push down on the rear tab of the load plate to swing the front of the load plate up slightly. Fully open the load plate. See Figure 19.

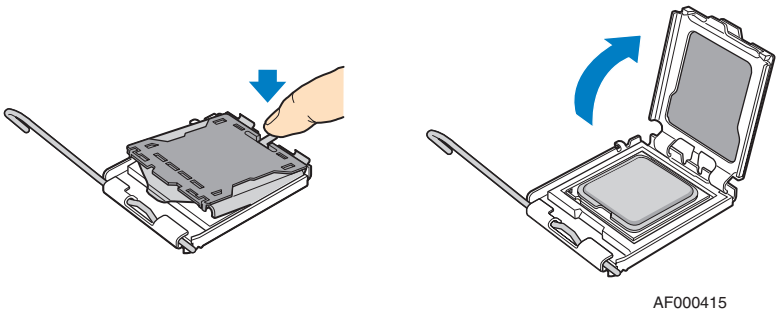


Figure 19. Opening Load Plate

12. Lift the processor from the socket. See Figure 15.

Caution: *Do not touch the contacts on either the processor or the processor socket.*

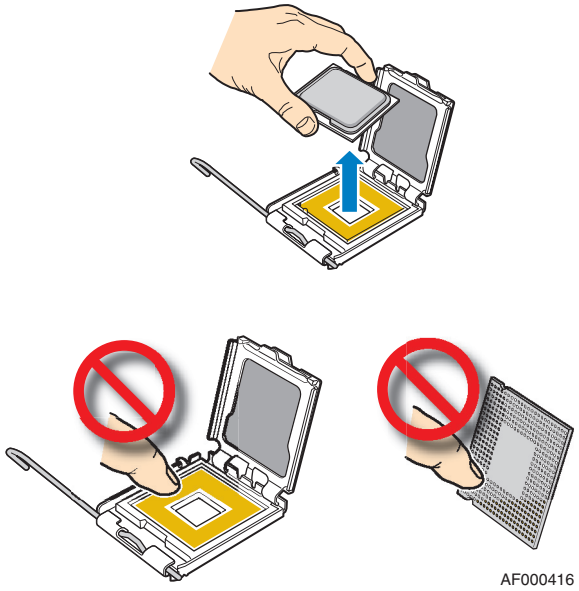


Figure 20. Removing Processor from Socket

13. Store the processor in the packaging materials in which it came.
14. Install the protective cover over the load plate if a replacement processor will not be installed.

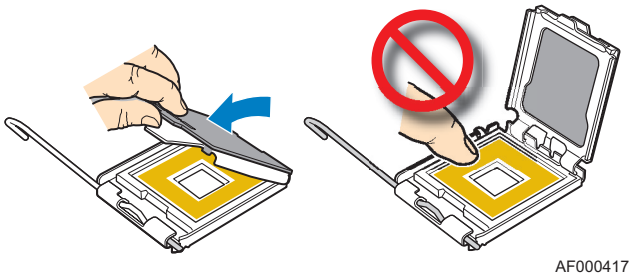


Figure 21. Installing Protective Cover onto Load Plate

15. Close the load plate.
16. Close the socket lever. Push downward on the socket lever while pushing it toward the center of the to engage it under the hook on the processor socket.
17. If installing a replacement processor, see "Installing the Processor" on page 31.
18. Reinstall and reconnect any parts you removed or disconnected to reach the processor sockets. See the documentation that came with your chassis for instructions on installing chassis components.
19. Replace the chassis cover. See the documentation that came with your chassis for instructions on installing the cover.

Replacing the CMOS Battery

The lithium CMOS battery on the workstation board powers the RTC in the absence of power. When the battery starts to weaken, it loses voltage, and the system settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

Warning: *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.*

Advarsel: *Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.*

Varning: *Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.*

Varoitus: *Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.*

1. Observe the safety and ESD precautions in “Safety Information” on page iii.
2. Turn off all peripheral devices connected to the workstation. Turn off the workstation.
3. Disconnect the AC power cord from the workstation.
4. Remove the chassis cover and locate the CMOS battery. See the documentation that came with your chassis for instructions on removing the cover.
5. Use a finger to pull the lever away from the top of the battery until it clears the battery. Use caution so you do not bend the lever.
6. Lift the battery from the socket.

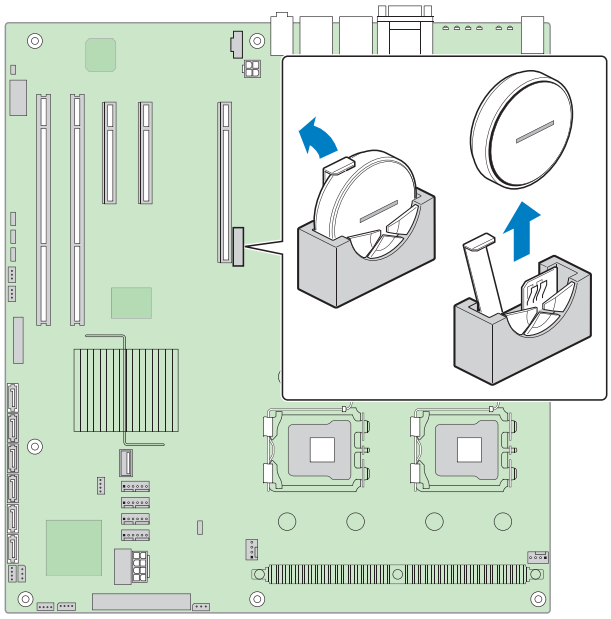


Figure 22. Locating and Removing the CMOS Battery

7. Dispose of the battery according to local ordinance.
8. Remove the new battery from its package.
9. Being careful to observe the correct polarity, insert the battery into the battery socket. The “+” side of the battery must face the lever side of the socket, toward the add-in card slots.
10. Reinstall and reconnect any parts you removed or disconnected to reach the battery. See the documentation that came with your chassis for instructions on installing chassis components.
11. Replace the chassis cover and reconnect the AC power cord. See the documentation that came with your chassis for instructions on installing the cover.
12. Run the BIOS Setup utility to restore the configuration settings to the real-time clock.

Appendix A: Getting Help

World Wide Web

http://support.intel.com/support/motherboards/server/S5000XVN.

Telephone

All calls are billed per incident, levied in local currency at the applicable credit card exchange rate plus applicable taxes. (Intel reserves the right to change the pricing for telephone support at any time without notice).

Before calling, fill out an "System Issue Report Form". A sample form is provided on the following pages. However, for the fastest service, please submit your form via the Internet.

For an updated support contact list, see http://www.intel.com/support/9089.htm/

U.S. and Canada

1-800-404-2284

Europe

Belgium 02 714 3182

Denmark ... 38 487077

Finland 9 693 79297

France..... 01 41 918529

Germany ... 069 9509 6099

Holland..... 020 487 4562

Italy..... 02 696 33276

Norway 23 1620 50

Spain..... 91 377 8166

Sweden..... 08 445 1251

UK..... 870 6072439

In Asia-Pacific Region

Australia.... 1800 649931

Cambodia.. 63 2 636 9797 (via Philippines)

China ..... 800 820 1100 (toll-free)

..... 8 621 33104691 (not toll-free)

Hong Kong 852 2 844 4456

India..... 0006517 2 68303634 (manual toll-free. You need an IDD-equipped telephone)

Indonesia... 803 65 7249

Korea 822 767 2595

Malaysia 1 800 80 1390

Myanmar... 63 2 636 9796 (via Philippines)

New Zealand 0800 444 365

Pakistan..... 632 63684 15 (IDD via Philippines)

Philippines 1 800 1 651 0117

Singapore .. 65 6213-1311

Taiwan 2 2545-1640

Thailand.... 1 800 631 0003

Vietnam..... 632 6368416 (IDD via Philippines)

Japan

Domestic.... 0120 868686

Outside country 81 298 47 0800

Latin America

Argentina .. Contact AT&T USA at 0-800 222 1288. Once connected, dial 800 843 4481

Brazil 001-916 377 0180

Chile

Easter Island. ..... Contact AT&T USA at 800 800 311. Once connected, dial 800 843 4481

Mainland and Juan .. Contact AT&T USA at 800 225 288. Once connected, dial 800 843 4481

Colombia ... Contact AT&T USA at 01 800 911 0010. Once connected, dial 800 843 4481

Costa Rica . Contact AT&T USA at 0 800 0 114 114. Once connected, dial 800 843 4481

Ecuador

(Andimate) .... Contact AT&T USA at 1 999 119. Once connected, dial 800 843 4481

(Pacifictel) ..... Contact AT&T USA at 1 800 225 528. Once connected, dial 800 843 4481

Guatemala . Contact AT&T USA at 99 99 190. Once connected, dial 800 843 4481

Mexico ..... Contact AT&T USA at 001 800 462 628 4240. Once connected, dial 800 843 4481

Miami 1 800 621 8423

Panama..... Contact AT&T USA at 00 800 001 0109. Once connected, dial 800 843 4481

Paraguay ... 001 916 377 0114

Peru 001 916 377 0114

Uruguay..... 001 916 377 0114

Venezuela... Contact AT&T USA at 0 800 2255 288. Once connected, dial 800 843 4481

Appendix B: Regulatory and Compliance Information

Product Regulatory Compliance

Product Safety Compliance

The Intel® Workstation Board S5000XVN complies with the following safety requirements:

- UL60950 - CSA 60950 (USA / Canada)
- EN60950 (Europe)
- IEC60950 (International)
- CB Certificate & Report, IEC60950 (report to include all country national deviations)
- Belarus License - Listed on System License (Belarus)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- IRAM Certification (Argentina)

Product EMC Compliance - Class A Compliance

Note: *Legally this product is required to comply with Class A emission requirements because it is intended for a commercial type market place. Intel targets 10db margin to Class A Limits.*

The Intel® Workstation Board S5000XVN has been has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed a compatible Intel® host system. For information on compatible host system(s) see Intel's Server Builder Web site or contact your local Intel representative.

- FCC /ICES-003 - Emissions (USA/Canada) Verification
- CISPR 22 - Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- CE - EMC Directive 89/336/EEC (Europe)
- VCCI Emissions (Japan)
- AS/NZS 3548 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)

- Belarus License - Listed on one System License (Belarus)
- RRL MIC Notice No. 1997-41 (EMC) & 1997-42 (EMI) (Korea)

Certifications / Registrations / Declarations

- UL Certification (US/Canada)
- CE Declaration of Conformity (CENELEC Europe)
- FCC/ICES-003 Class A Attestation (USA/Canada)
- C-Tick Declaration of Conformity (Australia)
- MED Declaration of Conformity (New Zealand)
- BSMI Certification (Taiwan)
- Belarus - Listed on one System License (Belarus)
- RRL Certification (Korea)
- Ecology Declaration (International)

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Table 6. Product Certification Markings

Regulatory Compliance	Region	Marking
UL Mark	USA/Canada	
CE Mark	Europe	
EMC Marking (Class A)	Canada	CANADA ICES-003 CLASS A CANADA NMB-003 CLASSE A
BSMI Marking (Class A)	Taiwan	 警告使用者： 這是甲類的資訊產品，在居住的環境中使用時， 可能會造成射頻干擾，在這種情況下，使用者會 被要求採取某些適當的對策
Ctick Marking	Australia / New Zealand	

Table 6. Product Certification Markings

Regulatory Compliance	Region	Marking
RLL MIC Mark	Korea	인증번호: CPU See the regulatory information document for additional information.

Electromagnetic Compatibility Notices

FCC (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

```
Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124-6497
1-800-628-8686
```

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

ICES-003 (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: “Apparelis Numériques”, NMB-003 édictee par le Ministre Canadian des Communications.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled: “Digital Apparatus,” ICES-003 of the Canadian Department of Communications.

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

VCCI (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

English translation of the notice above:

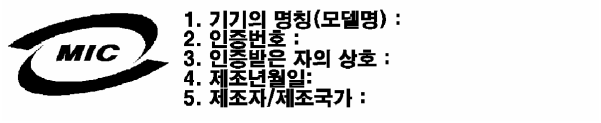
This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

BSMI (Taiwan)

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

RRL (Korea)



English translation of the notice above:

1. Type of Equipment (Model Name): On License and Product
2. Certification No.: On RRL certificate. Obtain certificate from local Intel representative
3. Name of Certification Recipient: Intel Corporation
4. Date of Manufacturer: Refer to date code on product
5. Manufacturer/Nation: Intel Corporation/Refer to country of origin marked on product

CNCA (CCC-China)

The CCC Certification Marking and EMC warning is located on the outside rear area of the product.

声明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取可行的措施。

Restriction of Hazardous Substances (RoHS) Compliance

Intel has a system in place to restrict the use of banned substances in accordance with the European Directive 2002/95/EC. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable threshold limits or (2) an approved / pending RoHS exemption applies.

RoHS implementation details are not fully defined and may change.

Threshold limits and banned substances are noted below:

- Quantity limit of 0.1% by mass (1000 PPM) for:
  - Lead
  - Mercury
  - Hexavalent Chromium
  - Polybrominated Biphenyls Diphenyl Ethers (PBDE)
- Quantity limit of 0.01% by mass (100 PPM) for:
  - Cadmium

End-of-Life / Product Recycling

Product recycling and end-of-life take-back systems and requirements vary by country. Contact the retailer or distributor of this product for information about product recycling and / or take-back.

Appendix C: Troubleshooting

This chapter helps you identify and solve problems that might occur while you are using the system.

For any issue, first ensure you are using the latest software.These software updates include updates for BIOS, the baseboard management controller (BMC), and the hot-swap controller (HSC). See "Additional Information and Software" on page viii for a link to the software updates. In addition to the system firmware and files, also update any drivers used for components you have installed in your system, such as video drivers and network drivers.

Intel provides a package called the "Platform Confidence Test" that may help with your diagnostics. See "Additional Information and Software" for a link to this software.

If you are unable to resolve your workstation problems on your own, see "Getting Help" on page 43 for assistance.

System Boot Quiet Time

The power-on self test (POST) process includes a quiet time, during which the system may appear to be hung. This may last as long as 40 seconds. Do not power off or reboot the system during this time. The POST LEDs will indicate activity. They may alternate blinking between amber and green. When the quiet time completes, the status LED will change to solid green.

Resetting the System

Before going through in-depth troubleshooting, attempt first to perform reset your system using one of the methods below.

Table 7. Resetting the System

To do this	Press
Soft boot reset to clear the system memory and reload the operating system	<Ctrl+Alt+Del>
Clear system memory, restart POST, and reload the operating system	Reset button
Cold boot reset. Turn the system power off and then on. This halts power to all peripherals, clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals	Power off/on button

Problems following Initial System Installation

Problems that occur at initial system startup are usually caused by an incorrect installation or configuration. Hardware failure is a less frequent cause. If the problem you are experiencing is with a specific software application, see "Problems with Newly Installed Application Software" on page 60.

First Steps Checklist

- Is AC power available at the wall outlet?
- Are the power supplies plugged in? Check the AC cable(s) on the back of the chassis and at the AC source.
- Are all cables correctly connected and secured?
- Are the processors fully seated in their sockets on the workstation board?
- Are all standoffs in the proper location and not touching any components, causing a potential short?
- Are all add-in PCI boards fully seated in their slots on the workstation board?
- Are all jumper settings on the workstation board correct?
- Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts-for example, two add-in boards sharing the same interrupt.
- Are all peripheral devices installed correctly?
- If the system has a hard disk drive, is it properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made in Setup correct?
- Is the operating system properly loaded? See the operating system documentation.
- Did you press the system power on/off switch on the front panel to turn the workstation on (power on light should be lit)?
- Is the system power cord properly connected to the system and plugged into a NEMA 5 15R outlet for 100-120V or a NEMA 6-15R outlet for 200-240 V?
- Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list. See "Additional Information and Software" on page viii for links to the tested component lists.

Hardware Diagnostic Testing

This section provides a more detailed approach to identifying a hardware problem and locating its source.

Caution: *Turn off devices before disconnecting cables: Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.*

1. Turn off the system and all external peripheral devices. Disconnect each device from the system, except for the keyboard and the video monitor.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in drive A and no CD-ROM disk in the CD-ROM drive.
5. If the power LED does light, attempt to boot from a floppy diskette or from a CD-ROM disk.
6. Turn on the system. If the power LED does not light, see "Power Light Does Not Light" on page 56.

Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:

- Does the diskette drive activity light turn on briefly? If not, see "CD-ROM Drive or DVD-ROM Drive Activity Light Does Not Light" on page 58.
- If system LEDs are illuminated, see "Intel® Light-Guided Diagnostics" on page 8 for a description of the lights.

Confirming Loading of the Operating System

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see "No Characters Appear on Screen".

Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light.
- No characters appear on screen.
- Characters on the screen appear distorted or incorrect.
- System cooling fans do not rotate.
- Hard disk drive activity light does not light.
- CD-ROM drive activity light does not light.
- There are problems with application software.
- The bootable CD-ROM is not detected.

Try the solutions below in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help.

Power Light Does Not Light

Check the following:

- Did you press the power-on button?
- Is the system operating normally? If so, the power LED might be defective or the cable from the control panel to the workstation board might be loose.
- Have you securely plugged the workstation AC power cord into the power supply?
- Some power supplies have a power switch on the back of the power supply, next to the fan. If your system has one, is it turned on?
- Remove all add-in cards and see if the system boots. If successful, add the cards back in one at a time with a reboot between each addition to determine which card might be causing the problem.
- Make sure the memory FBDIMMs comply with the system requirements.
- Make sure the memory FBDIMMs have been populated according to the system requirements.
- Remove the memory FBDIMMs and re-seat them.
- Make sure the processor(s) comply with the system requirements.
- Make sure the processor(s) have been populated according to the system requirements.
- Remove the processor(s) and re-seat them.
- Make sure the chassis standoffs are installed only below mounting holes. Misplaced standoffs can contact the pins on the bottom of the workstation board and cause a short.
- In a DC powered system, make sure all DC cables are connected.

No Characters Appear on Screen

Check the following:

- Is the keyboard functioning? Test it by turning the “Num Lock” function on and off to make sure the Num Lock light is functioning.
- Is the video monitor plugged in and turned on? If you are using a switch box, is it switched to the correct system?
- Are the brightness and contrast controls on the video monitor properly adjusted?
- Is the video monitor signal cable properly installed?
- Does this video monitor work correctly if plugged into a different system?
- Is the onboard video controller enabled in the BIOS?
- Remove all add-in cards and see if the video returns. If successful, add the cards back in one at a time with a reboot between each addition to determine which card might be causing the problem.
- Make sure the memory FBDIMMs comply with the system requirements.
- Make sure the memory FBDIMMs have been populated according to the system requirements.
- Remove the memory FBDIMMs and re-seat them.
- Make sure the processor(s) comply with the system requirements.
- Make sure the processor(s) have been populated according to the system requirements.
- Remove the processor(s) and re-seat them.

If you are using an add-in video controller board, do the following:

1. Verify that the video works using the onboard video controller.
2. Verify that the video controller board is fully seated in the workstation board connector.
3. Reboot the system for changes to take effect.
4. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.
5. If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. Contact your service representative or authorized dealer for help.

Characters Are Distorted or Incorrect

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer's documentation.
- Are the video monitor's signal and power cables properly installed?
- Does this video monitor work correctly if plugged into a different system?

System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, it is an indication of possible system component failure.

Check the following:

- Is the power-on light lit? If not, see "Power Light Does Not Light" on page 56.
- If your system has LED lights for the fans, is one or more of these LEDs lit?
- Are any other control panel LEDs lit?
- Have any of the fan motors stopped? Use the server management subsystem to check the fan status.
- Have your fans speeded up in response to an overheating situation?
- Have your fans speeded up in response to a fan that has failed?
- Are the fan power connectors properly connected to the workstation board?
- Is the cable from the control panel board connected to the both the control panel board and to the workstation board?
- Are the power supply cables properly connected to the workstation board?
- Are there any shorted wires caused by pinched-cables or have power connector plugs been forced into power connector sockets the wrong way?

CD-ROM Drive or DVD-ROM Drive Activity Light Does Not Light

Check the following:

- Are the CD-ROM/DVD-ROM drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?

Cannot Connect to a Server

- Make sure the network cable is securely attached to the correct connector at the system back panel.
- Try a different network cable.
- Make sure you are using the correct and the current drivers. See "Additional Information and Software" on page viii for a link to the current drivers.
- Make sure the driver is loaded and the protocols are bound.
- Make sure the hub port is configured for the same duplex mode as the network controller.
- Make sure the correct networking software is installed.
- If you are directly connecting two servers (without a hub), you will need a crossover cable.
- Check the network controller LEDs next to the NIC connectors.

Problems with Network

The system hangs when the drivers are loaded

- Certain drivers may require interrupts that are not shared with other PCI drivers. For these drivers, it may be necessary to alter settings so that interrupts are not shared. See the documentation that came with your PCI card(s) for information on changing interrupts.

Diagnostics pass but the connection fails

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in your NET.CFG file.
- The controller stopped working when an add-in adapter was installed.
- Make sure the cable is connected to the port from the onboard network controller.
- Make sure your BIOS is current. See "Additional Information and Software" for a link to the current version.
- Make sure the other adapter supports shared interrupts. Make sure your operating system supports shared interrupts.
- Try reseating the add-in adapter.

The add-in adapter stopped working without apparent cause

- Reseat the adapter.
- Put the adapter in a different slot.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Run diagnostics.

System Boots when Installing PCI Card

System management features require full-time “standby” power. This means some parts of the system have power going to them whenever the power cord is plugged in, even if you have turned the system power off with the power button on the front panel. If you install a PCI card with the AC power cord plugged in, a signal may be sent to command the system to boot. Before installing a PCI card, you should always:

- Turn off the workstation power by using the power button on the front of the system.
- Unplug the AC power cord(s) from the workstation.

Problems with Newly Installed Application Software

Problems that occur when you run new application software are usually related to the software, not the workstation hardware. Faulty equipment is unlikely, especially if other software runs correctly.

Check the following:

- Make sure the system meets the minimum hardware requirements for the software. See the software documentation.
- Make sure the software is properly installed and configured for the system. See the software documentation.
- Use only an authorized copy. Unauthorized copies often do not work.
- If you are running the software from a USB floppy disk, CD-ROM or DVD-ROM, try a different disk.
- Make sure the correct device drivers installed.

If the problems persist, contact the software vendor's customer service representative.

Problems with Application Software that Ran Correctly Earlier

Problems that occur after the system hardware and software have been running correctly sometimes indicate equipment failure. However, they can also be caused by file corruption or changes to the software configuration.

Check the following:

- If you are running the software from a USB floppy disk, CD-ROM or DVD-ROM, try a different disk.
- Check your system for a virus infection.
- Uninstall and reinstall the software. Make sure all necessary files are installed.
- If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.

Note: *Random errors in data files: If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.*

Devices are not Recognized under Device Manager (Windows* Operating System)

The Windows* operating systems do not include all of the drivers for the Intel® chipsets, onboard NICs, and other components. See "Additional Information and Software" on page viii for a link to the current drivers and chipset files.

Hard Drive(s) are not Recognized

Check the following:

- Make sure the drive is not disabled in BIOS Setup.
- Make sure the drive is connected correctly and that is plugged into the power supply.
- Make sure the drive is compatible. See "Additional Information and Software" for a link to the tested drives.
- Make sure you have not exceeded the power budget for the workstation. See "Additional Information and Software" for a link to software to check your power budget.

- Verify your SAS or SATA drives are connected to the correct ports on the workstation board and the chassis backplane. See your chassis documentation for details about backplane connections.
- If using ATA drives, verify that the master/slave settings are set correctly. See your drive documentation for details on setting the master/slave settings.
- If using a RAID configuration with an add-in RAID adapter, make sure the RAID adapter is installed correctly.

Bootable CD-ROM Disk Is Not Detected

Check the following:

- Make sure the BIOS is configured to allow the CD-ROM to be the first bootable device.

LED Information

The Intel® Workstation Board S5000XVN includes LEDs that can aid in troubleshooting your system. For the location of the LEDs, see "Intel® Light-Guided Diagnostics" on page 8.

BIOS POST Beep Codes

The table below lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions. Please note that not all error conditions are supported by BIOS beep codes.

Table 8. POST Error Beep Codes

Number of Beeps	Reason for Beeps and Action to Take
1, 2, or 3	Memory error. Reseat the memory or replace the FBDIMMs with known good modules.
4 - 7 or 9 - 11	Fatal error indicating a possible serious system problem. Remove all add-in cards and re-start the system. If the error still occurs, contact your service representative. If the beep codes are not generated after the add-in cards are removed, insert the cards one at a time, booting the system between each card addition, until the beeps again occur to reveal the malfunctioning card.
8	Replace or reseat the system video add-in card. If on-board video is being used, the workstation board may be faulty.

In addition to the beep codes above, additional beep codes are provided if an Intel® Remote Management Module is installed. The Intel® Remote Management Module provides the following additional beep codes.

Table 9. Error Beep Codes Generated by Intel® Remote Management Module

Number of Beeps	Reason for Beeps and Action to Take
1	Front panel CMOS clear has been initiated.
1-5-1-1	Processor failure. Reseat or replace the failed processor.
1-5-2-1	No processor is installed or the CPU 1 socket is empty. Reseat or replace the failed processor.
1-5-2-3	Processor configuration error or CPU 1 socket is empty. Reseat or replace the failed processor. In a two-processor system, make sure the processors are identical.
1-5-2-4	Front-side bus select configuration error.
1-5-4-2	DC power unexpectedly lost.
1-5-4-3	Chipset control failure.
1-5-4-4	Power control failure.

Appendix D: System Issue Report Form

Note: *An on-line / automatic submission version of this form is available at http://support.intel.com/support/motherboards/server/S5000XVN/. For the fastest service, please submit your form via the Internet.*

Date Submitted: _____

Company Name: _____

Contact Name: _____

Email Address: _____

Intel Workstation Product: _____

Priority (Critical, Hot, High, Low): _____

Brief Problem Description. Provide a brief description below. See the last page for space to include a detailed problem description.

_____

_____

_____

_____

Board / Chassis Information

Baseboard Revision - PBA#: _____

Baseboard Serial Number: _____

Chassis Model: _____

CPU1 Speed/Stepping/Spec: _____

CPU2 Speed/Stepping/Spec: _____

System BIOS Version: _____

HSC Firmware Version: _____

BMC Firmware Version: _____

FBDIMM Configuration

DIMM A1 MB and vendor / part number: _____

DIMM A2 MB and vendor / part number: _____

DIMM B1 MB and vendor / part number: _____

DIMM B2 MB and vendor / part number: _____

DIMM C1 MB and vendor / part number: _____

DIMM C2 MB and vendor / part number: _____

DIMM D1 MB and vendor / part number: _____

DIMM D2 MB and vendor / part number: _____

Operating System Information

Operating System:_____

Version: _____

Service Pack / Update: _____

Add-in Card, Peripheral, Video, NIC

Check each box below as applicable, and provide the requested information.

Peripheral	Description	Driver Revision	IRQ	I/O Base Address	FW Revision
Add-in Card					
Slot 1					
Slot 2					
Slot 3					
Slot 4					
Slot 5					
Video					
Add-in video					
NIC					
On-board NIC1					
On-board NIC2					

Hard Drive Information

Drive Type (SATA, SAS, etc.)	Make/Model	Hot-swap or Fixed	IRQ	FW Revision

Control Panel Information

Standard Control Panel _____

Intel® Local Control Panel_____

Complete Problem Description

In the space below, provide a complete description of the steps used to reproduce the problem or a complete description of where the problem can be found. Please also include any details on troubleshooting already done.